81 and bottom plate 83 function as reinforcement layers made from stainless plates that are 1mm and 0.5mm thick, respectively, and although they, too, are formed using wet etching, processing precision is slightly less than that of the middle plate due to their thickness.

Therefore, the slits in top plate 81 and bottom plate 83 are slightly wider than that of short side datum A and long side datum B, B' middle plate 82, and since positioning plate 41 is formed by layering and bonding these 3 plates, head chip 20 is inserted so as to come into contact only with the high precision middle plate 82. In addition, as a result of this 3-layer configuration, mechanical strength is greatly enhanced and retention of airtightness during ink suction is ensured. Moreover, it is also possible to use only one of the reinforcing top plate 81 or bottom plate 82, or to create a structure of four or more layers. Note that integration of layers can be achieved using an adhesive as well as diffusion bonding or other bonding methods.

Furthermore, in this embodiment, the electrical system has been simplified in order to make replacement of head unit 20 easier. In other words, as can be seen in the structural view of head unit 20 in Figure 1, an internal piezoelectric element drive circuit has been installed inside unit head 20 so that the number of head unit 20 interface signals is reduced and, as seen in Figure 2, the top of head unit 20 is equipped with interface connector 27 such that by using motherboard 51 described in Figure 1 for a direct connection, both power and interface signals can be supplied, and replacement or addition of individual units is made easier.
In addition, the connector cable has also been simplified.

Scope of Claims

1. An inkjet recording head equipped with multiple edge shooter type head units with a head chip formed such that the nozzle discharge surfaces of the nozzles that discharge ink are distributed in a straight line at regular intervals in a continuous array and positioning plates that fix the positions of multiple head units such that these positioning plates are distributed in parallel rows that slope with respect to the line array direction of the multiple head units, and the nozzle intervals in the direction of 2 nozzle line arrays adjacent to the nozzle injection surfaces form the slope angle that corresponds to a given resolution.

2. In the inkjet recording head described in Claim 1, the positioning plate is equipped with a slit that wedges and pushes the head chip of the head unit in such a fashion that the airtight bonding of the slit datum plane of the positioning plate and the surface of the head unit's head chip allows the position of the head unit to be fixed in relation to the positioning plate.

3. The inkjet recording head described in Claims 1 and 2 equipped with installation screws on both edges of the head unit that are screwed into the positioning plate surface in the vertical direction – one screwed in the left (counterclockwise) direction, the other in the right (clockwise) direction, tangent screws that are screwed into the positioning plate surface and turn horizontally to come into contact with the head unit, such that the lengthwise direction of head chip is subjected in one direction to the suppressive force of the tangent screws and the widthwise direction of head chip is subjected in the other direction to the suppressive force generated when the left and right installation screws on both edges of the head unit are tightened, thereby adhering the positioning plate datum to the head chip.

4. The inkjet recording head described in either Claim 1 to Claim 3 equipped with a beam comprising the structural component that stretches across the positioning plate and is arrayed with and holds multiple rows of head units.

5. The inkjet recording head described in Claim 4 equipped with ink flow channels formed to cover the canals on the beam and supply ink to the head unit, or an ink flow channel formed using piping laid in the canals on the beam.

6. The inkjet recording head described in Claim 5 equipped with an ink source that supplies ink from both sides of the ink flow channel.

7. The inkjet recording head described in one of the claims from Claim 1 to Claim 6 equipped with a sealant that is inserted to ensure an airtight seal between the head units and the positioning plate.

8. The inkjet recording head described in one of the Claims from 1 to 7 equipped with a multilayer structure where the abovementioned positioning plate is comprised of a datum formation layer that forms the datum and a reinforcement layer for retention of mechanical strength.

9. The inkjet recording head described in one of the Claims from 1 to 8 equipped with an internal electrical drive circuit for activating the piezoelectric element inside the head unit, 10 connectors connected to the electrical drive circuit, and a motherboard where a connector is directly connected to each of the multiple head units arranged in rows.

Summary

The inkjet recording head (100) in this invention is equipped with multiple edge shooter type head units (20) with a head chip formed by nozzle discharge surfaces, positioning plates (41) distributed in parallel rows that slope with respect to the line array direction of the multiple head units (20), where in addition to the distribution of the positioning plates (41) in parallel rows that slope with respect to the line array direction of the multiple head units (20), the nozzle intervals in the line array direction of 2 nozzles (21a) adjacent to each other on the straight line of the nozzle injection surfaces form the slope angle that corresponds to the specified resolution.